Amendments to the Claims:

Please amend the claims as shown in the Listing of Claims below. The listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS WITH MARKINGS TO SHOW CHANGES MADE

1. (original) A thermally activatable antioxidant precursor compound of the formula:

A—B

wherein A and B are the same or different, each consisting of a moiety other than a hydrogen atom; and

wherein A and B are connected via a labile bond, and are able to dissociate through breakage of the labile bond upon exposure of said compound to a predetermined temperature shift from a lower temperature to a higher temperature, thereby to generate corresponding free radicals A• and B• at least one of which being suitable for use as an antioxidant.

2. (currently amended) The thermally activatable antioxidant precursor compound of claim 1, wherein each of A and B comprises a monocyclic aromatic or polycyclic aromatic ring system, optionally substituted at one or more positions[[.]] and optionally comprising a heterocyclic ring.

3. (original) The thermally activatable antioxidant precursor compound of claim 1, wherein the labile bond is a carbon-carbon bond and each of the free radicals A• and B• is a carbon centered free radical.

4. (cancelled)

5. (cancelled)

6. (cancelled)

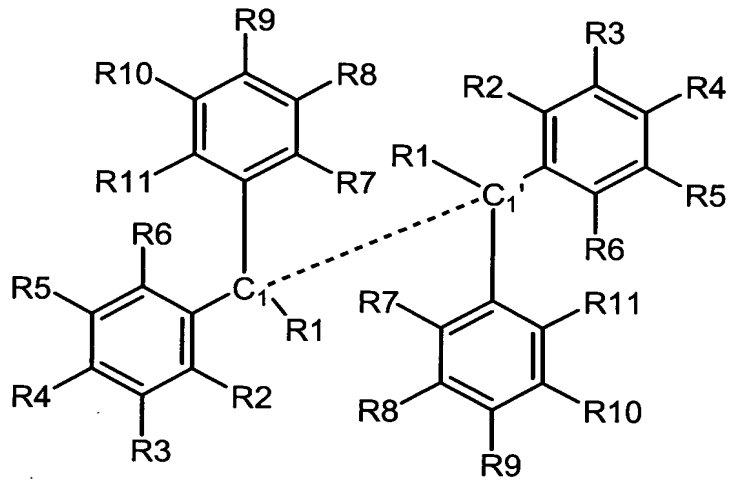
7. (original) The thermally activatable antioxidant precursor compound of claim 1, wherein the free radicals A• and B• are able to re-associate through the formation of a labile bond upon exposure of said radicals to a predetermined temperature shift from a higher temperature to a lower temperature thereby to regenerate the corresponding antioxidant precursor compound of the formula:

A—B.

8. (cancelled)

9. (cancelled)

10. (currently amended) The thermally activatable antioxidant precursor compound of claim 1, wherein the compound A-B is selected from a compound[[s]] of the formula X:



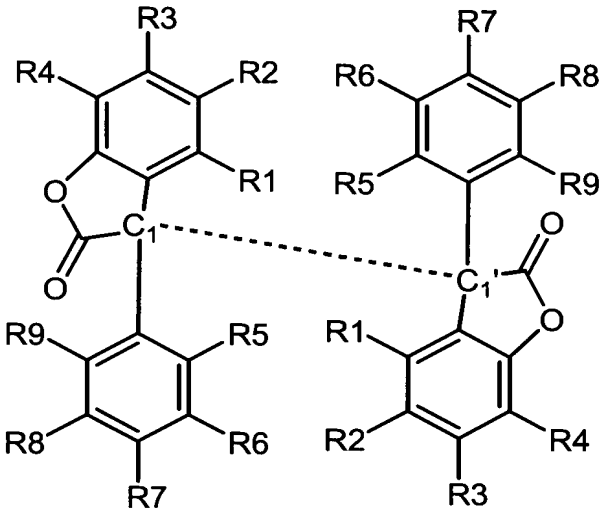
X

wherein the dashed line represents the labile bond susceptible to breakage upon exposure of said compound to a temperature shift from a lower temperature to a higher temperature; and wherein R1-R11 are the same or different, each independently selected from hydrogen or a substituent selected from the following group: linear or branched C_1-C_{18} alkyl, linear or branched C_2-C_{18} alkenyl, linear or branched C_2-C_{18} alkynyl, CN, $CHal_3$ (where Hal=Cl, Br or F), CO_2R16 (where R16 comprises hydrogen or a ~~substituant~~ substituent selected from a linear or branched C_1-C_{18} alkyl, linear or branched C_2-C_{18} alkenyl, linear or branched C_2-C_{18} alkynyl, C_5-C_8 cycloalkyl, and C_6-C_{20} aryl), NO_2, C_5-C_8 cycloalkyl optionally substituted

with one or more C_1-C_{18} alkyl, and C_6-C_{20} aryl, optionally substituted with one or more C_1-C_{18} alkyl,

and wherein optionally any two of R2 to R11 within the same moiety of A or B may be linked to form a substituted or unsubstituted bicyclic or polycyclic ~~fusedring~~ fused ring system, and wherein optionally R1 may be linked to one or more of R2, R6, R7, and R11 within the same moiety of A or B, to form a substituted or unsubstituted bicyclic or polycyclic fused ring system optionally comprising one or more heterocyclic rings[[.]];

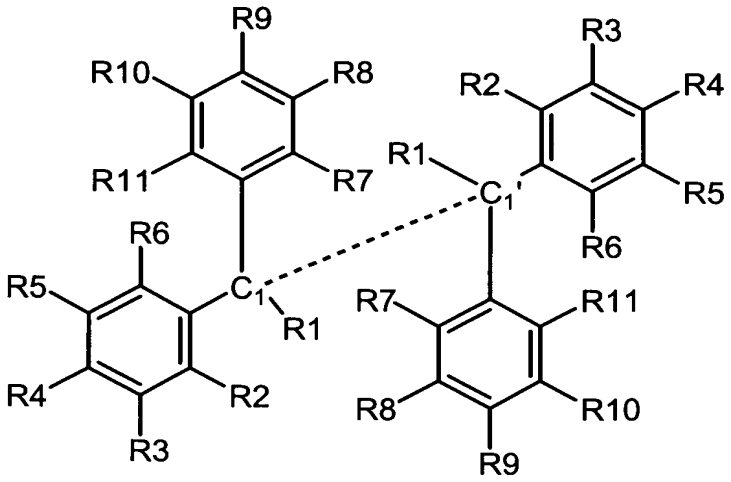
or a compound of formula I:



I

wherein the dashed line represents the labile bond susceptible to breakage upon exposure of said compound to a temperature shift from a lower temperature to a higher temperature; and wherein R1 to R9 are the same or different, each independently selected from hydrogen or a substituent selected from the following group: linear or branched C_1-C_{18} alkyl, linear or branched C_2-C_{18} alkenyl, linear or branched C_2-C_{18} alkynyl, CN, $CHal_3$ (where Hal=Cl, Br or F), CO_2R16 (where R16 comprises hydrogen or a substituent selected from a linear or branched C_1-C_{18} alkyl, linear or branched C_2-C_{18} alkenyl, linear or branched C_2-C_{18} alkynyl, C_5-C_8 cycloalkyl, and C_6-C_{20} aryl), NO_2, C_5-C_8 cycloalkyl optionally substituted with one or more C_1-C_{18} alkyl, and C_6-C_{20} aryl, optionally substituted with one or more C_1-C_{18} alkyl;

or a compound of formula II:



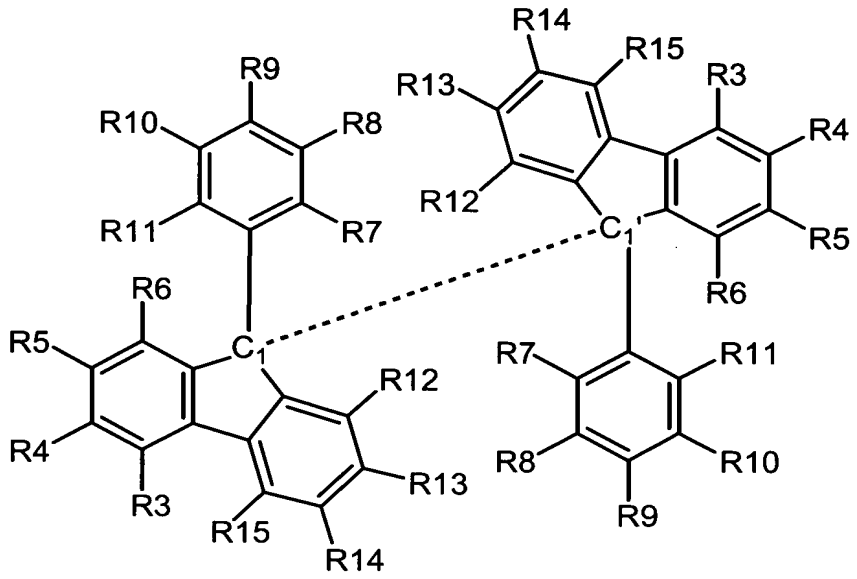
II

wherein the dashed line represents the labile bond susceptible to breakage upon exposure to a higher temperature; and

wherein R1 represents an electron withdrawing group optionally selected from CN, $CHal_3$ (where Hal=Cl, Br or F), CO_2R16 (where R16 comprises hydrogen or a substituent selected from a linear or branched C_1-C_{18} alkyl, linear or branched C_2-C_{18} alkenyl, linear or branched C_2-C_{18} alkynyl, C_5-C_8 cycloalkyl, and C_6-C_{20} aryl), and NO_2;

R2-R11 are the same or different, each independently selected from hydrogen or a substituent selected from the following group: linear or branched C_1-C_{18} alkyl, linear or branched C_2-C_{18} alkenyl, linear or branched C_2-C_{18} alkynyl, CN, $CHal_3$ (where Hal=Cl, Br or F), CO_2R16 (where R16 comprises hydrogen or a substituent selected from a linear or branched C_1-C_{18} alkyl, linear or branched C_2-C_{18} alkenyl, linear or branched C_2-C_{18} alkynyl, C_5-C_8 cycloalkyl, and C_6-C_{20} aryl), NO_2, C_5-C_8 cycloalkyl optionally substituted with one or more C_1-C_{18} alkyl, and C_6-C_{20} aryl, optionally substituted with one or more C_1-C_{18} alkyl; or

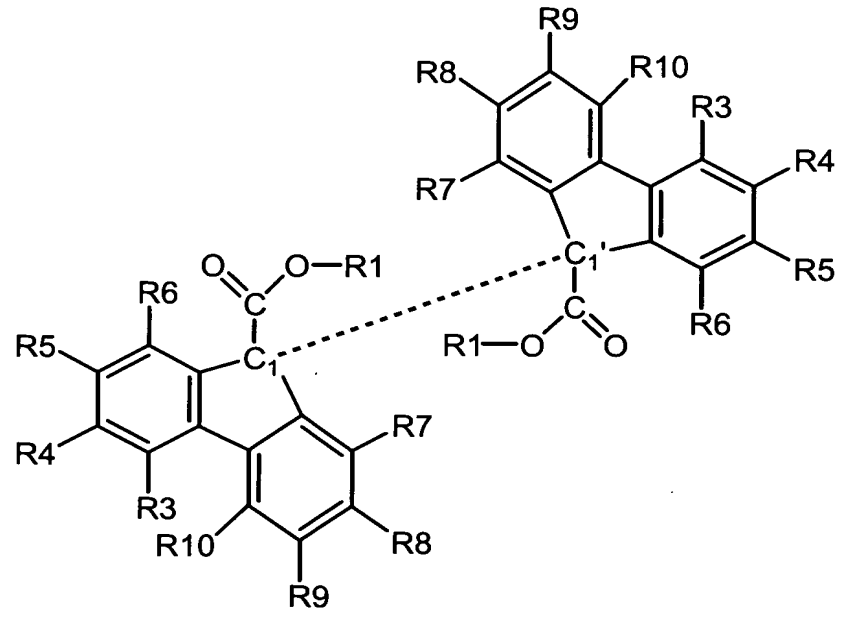
a compound of formula III:



III

wherein the dashed line represents the labile bond susceptible to breakage upon exposure to a higher temperature; and

wherein R3-R15 are the same or different, each independently selected from hydrogen or a substituent selected from the following group: linear or branched C_1-C_{18} alkyl, linear or branched C_2-C_{18} alkenyl, linear or branched C_2-C_{18} alkynyl, CN, $CHal_3$ (where Hal=Cl, Br or F), CO_2R16 (where R16 comprises hydrogen or a substituent selected from a linear or branched C_1-C_{18} alkyl, linear or branched C_2-C_{18} alkenyl, linear or branched C_2-C_{18} alkynyl, C_5-C_8 cycloalkyl, and C_6-C_{20} aryl), NO_2, C_5-C_8 cycloalkyl optionally substituted with one or more C_1-C_{18} alkyl, and C_6-C_{20} aryl, optionally substituted with one or more C_1-C_{18} alkyl; or a compound of formula IV:

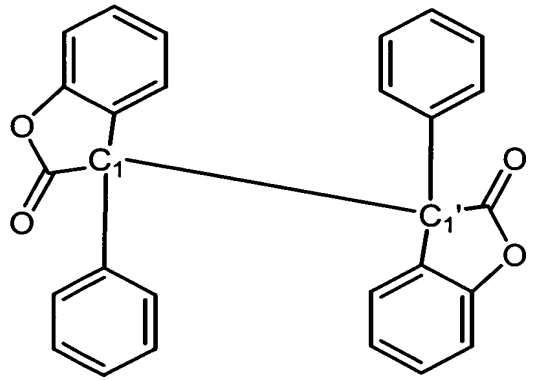


IV

wherein the dashed line represents the labile bond susceptible to breakage upon exposure to a higher temperature; and

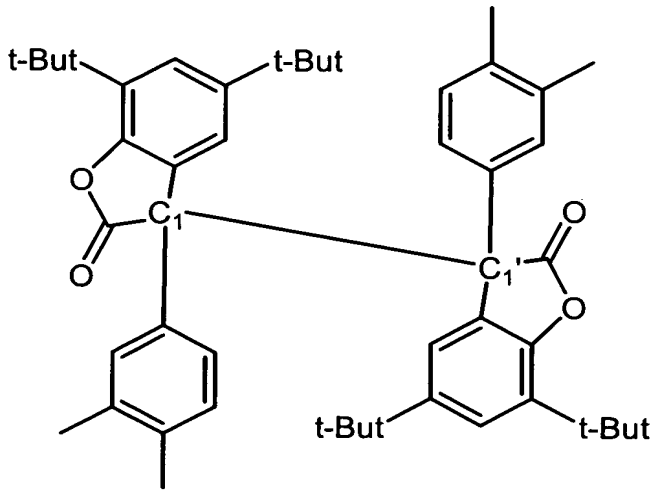
wherein R1 and R3-R10 are the same or different, each independently selected from hydrogen or a substituent selected from the following group: linear or branched C_1-C_{18} alkyl, linear or branched C_2-C_{18} alkenyl, linear or branched C_2-C_{18} alkynyl, CN, $CHal_3$ (where Hal=Cl, Br or F), CO_2R16 (where R16 comprises hydrogen or a substituent selected from a linear or branched C_1-C_{18} alkyl, linear or branched C_2-C_{18} alkenyl, linear or branched C_2-C_{18} alkynyl, C_5-C_8 cycloalkyl, and C_6-C_{20} aryl), NO_2, C_5-C_8 cycloalkyl optionally substituted with one or more C_1-C_{18} alkyl, and C_6-C_{20} aryl, optionally substituted with one or more C_1-C_{18} alkyl; or

a compound of formula IA:



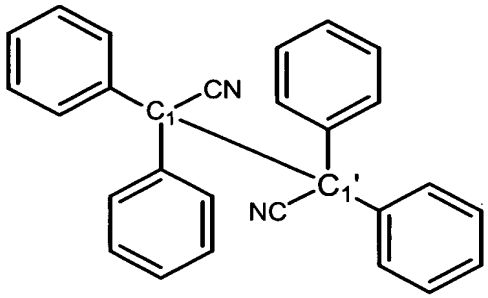
IA

or a compound of formula IB:



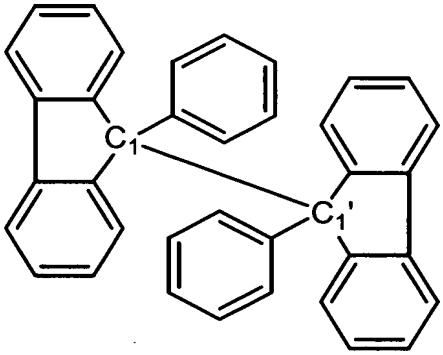
IB

or a compound of formula IIA:



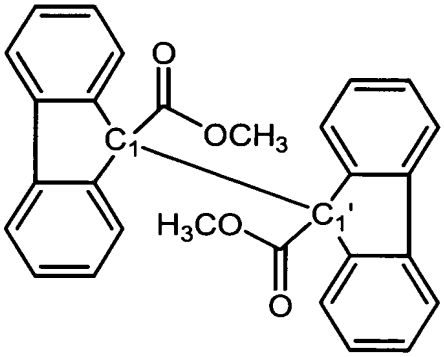
IIA

or a compound of formula IIIA:



IIIA

or a compound of formula IVA:



IVA

11. (cancelled)

12. (cancelled)

13. (cancelled)

14. (cancelled)

15. (cancelled)

16. (cancelled)

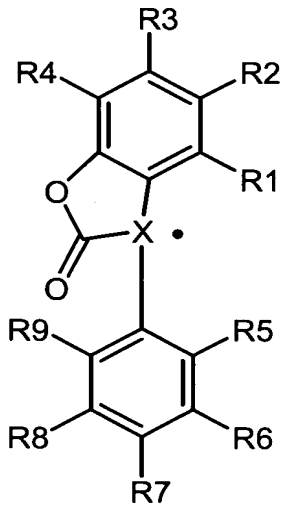
17. (cancelled)

18. (cancelled)

19. (cancelled)

20. (cancelled)

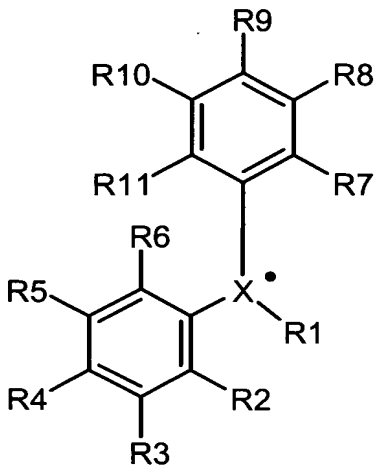
21. (currently amended) The thermally activatable antioxidant precursor compound of claim 1, wherein one of or both of the free radicals A• and B• are of the formula V:



V

wherein X represents C_1 or C_1' and R1 to R9 are the same or different, each independently selected from hydrogen or a substituent selected from the following group: linear or branched C_1-C_{18} alkyl, linear or branched C_2-C_{18} alkenyl, linear or branched C_2-C_{18} alkynyl, CN, $CHal_3$ (where Hal=Cl, Br or F), CO_2R16 (where R16 comprises hydrogen or a substituent selected from a linear or branched C_1-C_{18} alkyl, linear or branched C_2-C_{18} alkenyl, linear or branched C_2-C_{18} alkynyl, C_5-C_8 cycloalkyl, and C_6-C_{20} aryl), NO_2, C_5-C_8 cycloalkyl optionally substituted with one or more C_1-C_{18} alkyl, and C_6-C_{20} aryl, optionally substituted with one or more C_1-C_{18} alkyl;

or one of or both of the free radicals A• and B• are of the formula VI:

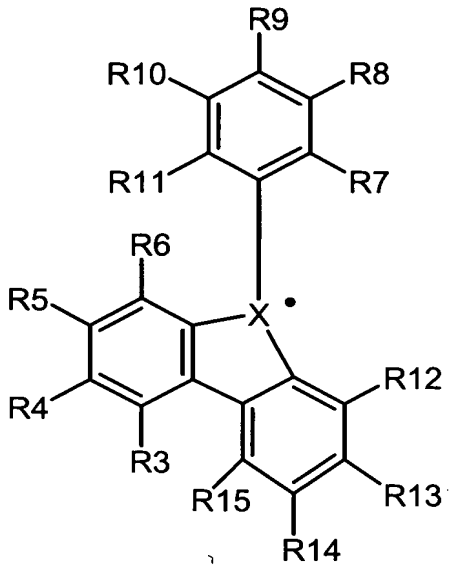


VI

wherein X represents C_1 or C_1' and R1 represents an electron withdrawing group selected from CN, $CHal_3$ (where Hal=Cl, Br or F), CO_2R16 (where R16 comprises hydrogen or a substituent selected from a linear or branched C_1-C_{18} alkyl, linear or branched C_2-C_{18} alkenyl, linear or branched C_2-C_{18} alkynyl, C_5-C_8 cycloalkyl optionally carrying C_1-C_{18} alkyl groups, and C_6-C_{20} aryl), and NO_2;

and R2 to R11 are the same or different, each independently selected from hydrogen or a substituent selected from the following group: linear or branched C_1-C_{18} alkyl, linear or branched C_2-C_{18} alkenyl, linear or branched C_2-C_{18} alkynyl, CN, $CHal_3$ (where Hal=Cl, Br or F), CO_2R16 (where R16 comprises hydrogen or a substituent selected from a linear or branched C_1-C_{18} alkyl, linear or branched C_2-C_{18} alkenyl, linear or branched C_2-C_{18} alkynyl, C_5-C_8 cycloalkyl, and C_6-C_{20} aryl), NO_2, C_5-C_8 cycloalkyl optionally substituted with one or more C_1-C_{18} alkyl, and C_6-C_{20} aryl, optionally substituted with one or more C_1-C_{18} alkyl;

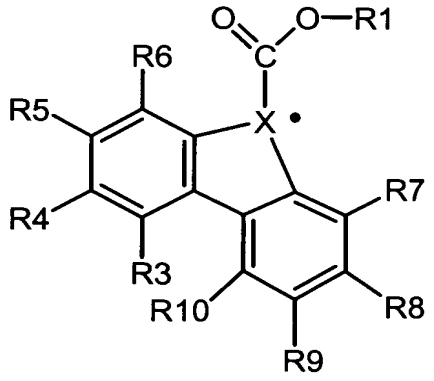
or one of or both of the free radicals A• and B• are of the formula VII:



VII

wherein X represents C_1 or C_1' and R3 to R15 are the same or different, each independently selected from hydrogen or a substituent selected from the following group: linear or branched C_1-C_{18} alkyl, linear or branched C_2-C_{18} alkenyl, linear or branched C_2-C_{18} alkynyl, CN, $CHal_3$ (where Hal=Cl, Br or F), CO_2R16 (where R16 comprises hydrogen or a substituent selected from a linear or branched C_1-C_{18} alkyl, linear or branched C_2-C_{18} alkenyl, linear or branched C_2-C_{18} alkynyl, C_5-C_8 cycloalkyl, and C_6-C_{20} aryl), NO_2, C_5-C_8 cycloalkyl optionally substituted with one or more C_1-C_{18} alkyl, and C_6-C_{20} aryl, optionally substituted with one or more C_1-C_{18} alkyl;

or one of or both of the free radicals A• and B• are of the formula VIII:

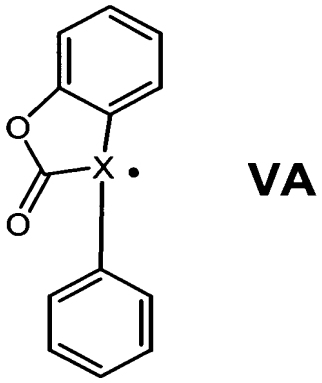


VIII

wherein X represents C_1 or C_1' and R1 and R3 to R10 are the same or different, each independently selected from hydrogen or a substituent selected from the following group: linear or branched C_1-C_{18} alkyl, linear or branched C_2-C_{18} alkenyl, linear or branched C_2-C_{18} alkynyl, CN, $CHal_3$ (where Hal=Cl, Br or F), CO_2R16 (where R16 comprises hydrogen or a substituent selected from a linear or branched C_1-C_{18} alkyl, linear or branched C_2-C_{18} alkenyl, linear or branched C_2-C_{18} alkynyl, C_5-C_8 cycloalkyl, and C_6-C_{20} aryl), NO_2, C_5-C_8 cycloalkyl

optionally substituted with one or more C_1-C_{18} alkyl, and C_6-C_{20} aryl, optionally substituted with one or more C_1-C_{18} alkyl;

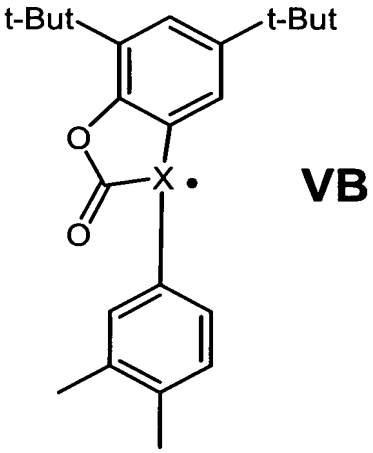
or one or both of the free radicals A• and B• are of the formula VA:



VA

wherein X represents C_1 or C_1';

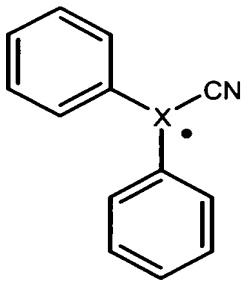
or either or both of the free radicals A• and B• are of the formula VB:



VB

wherein X represents C_1 or C_1';

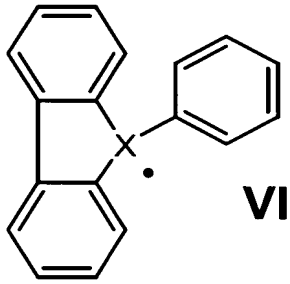
or either or both of the free radicals A• and B• are of the formula VIA:



VIA

wherein X represents C_1 or C_1';

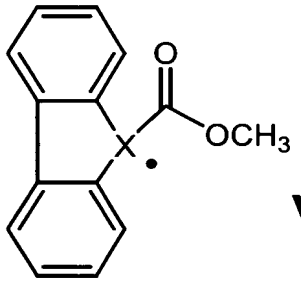
or either or both of the free radicals A• and B• are of the formula VIIA:



VIIA

wherein X represents C_1 or C_1';

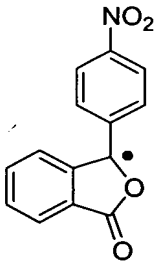
or either or both of the free radicals A• and B• are of the formula VIIIA:



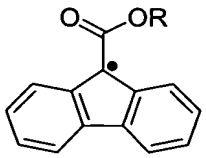
VIIIA

wherein X represents C_1 or C_1';

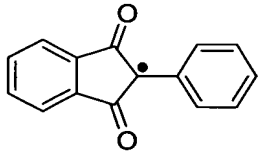
or at least one of A• and B• is selected from the group consisting of:



,



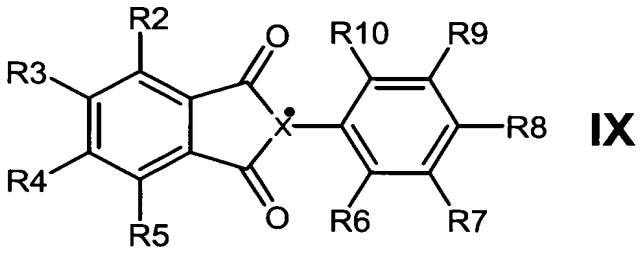
and



wherein R is selected from hydrogen or a substituent selected from the following group: linear or branched C_1-C_{18} alkyl, linear or branched C_2-C_{18} alkenyl, linear or branched C_2-C_{18} alkynyl, CN, $CHal_3$ (where Hal=Cl, Br or F), CO_2R16 (where R16 comprises hydrogen or a substituent selected from a linear or branched C_1-C_{18} alkyl, linear or branched C_2-C_{18} alkenyl, linear or branched C_2-C_{18} alkynyl, C_5-C_8 cycloalkyl, and C_6-C_{20} aryl), NO_2, C_5-C_8 cycloalkyl

optionally substituted with one or more C_1-C_{18} alkyl, and C_6-C_{20} aryl, optionally substituted with one or more C_1-C_{18} alkyl;

or one of or both of the free radicals A• and B• are of the formula IX:



IX

wherein X represents C_1 or C_1', and R1 to R10 are the same or different, each independently selected from hydrogen or a substituent selected from the following group: linear or branched C_1-C_{18} alkyl, linear or branched C_2-C_{18} alkenyl, linear or branched C_2-C_{18} alkynyl, CN, $CHal_3$ (where Hal=Cl, Br or F), CO_2R16 (where R16 comprises hydrogen or a substituent selected from a linear or branched C_1-C_{18} alkyl, linear or branched C_2-C_{18} alkenyl, linear or branched C_2-C_{18} alkynyl, C_5-C_8 cycloalkyl, and C_6-C_{20} aryl), NO_2, C_5-C_8 cycloalkyl optionally substituted with one or more C_1-C_{18} alkyl, and C_6-C_{20} aryl, optionally substituted with one or more C_1-C_{18} alkyl.

22. (cancelled)

23. (cancelled)

24. (cancelled)

25. (cancelled)

26. (cancelled)

27. (cancelled)

28. (cancelled)

29. (cancelled)

30. (cancelled)

31. (cancelled)

32. (cancelled)

33. (currently amended) The thermally activatable antioxidant precursor compound of claim 1, with the proviso that the compound is not the compound of formula (11) disclosed in United States Patent 5,367,008 or the compound of formula (10) disclosed in United States Patent 5,428,177 or the dimeric form of Irganox HP-136 (Ciba ~~Speciality~~ Specialty Products) or related dimeric products.

34. (currently amended) The thermally activatable antioxidant precursor compound of claim 1, wherein the bond dissociation energy of the labile bond is less than 80 kcal/mol[[.]], preferably less than 50 kcal/mol, more preferably less than 25 kcal mol, most preferably less than 20 kcal/mol.

35. (cancelled)

36. (cancelled)

37. (cancelled)

38. (original) The thermally activatable antioxidant compound of claim 1, wherein said temperature shift is from a lower temperature of from 0°C to 40°C to a higher temperature of from 20°C to 400°C.

39. (currently amended) Use of a compound of the formula:

A—B

as defined in ~~any one of~~ claim[[s]] 1 [[to 38]], as a thermally activatable antioxidant precursor compound.

40. (currently amended) A composition comprising: (a) a compound susceptible to oxidation; and (b) the thermally activatable antioxidant precursor compound of ~~any one of~~ claim[[s]] 1 ~~to 38.~~, wherein the compound (a) is optionally more susceptible to oxidation at a higher temperature than at a lower temperature.

41. (cancelled)

42. (currently amended) A method for generating an antioxidant, the method comprising the steps of:

a) providing an antioxidant precursor compound of the formula:

A—B

as described in ~~any one of~~ claim[[s]] 1 [[to 38]]; and

b) adjusting the temperature of A-B to thereby cause dissociation of the compound into free radicals A• and B•[[.]] at least one of which is suitable for use as an antioxidant.

43. (original) The method of claim 42, wherein the step of adjusting comprises shifting the temperature of the antioxidant precursor compound from a lower temperature of from 0°C to 40°C to a higher temperature of from 20°C to 400°C.

44. (cancelled)

45. (original) The method of claim 43 wherein the antioxidant precursor compound can be at least in part reformed at said lower temperature; step b) comprising heating the antioxidant precursor compound to said higher temperature, the method further comprising step c) cooling the free radicals A• and B• formed in step b) to said lower temperature to thereby cause at least partial reassociation of the free radicals A• and B• into the thermally activatable antioxidant precursor compound A-B.

46. (cancelled)

47. (currently amended) A method of preventing or slowing oxidation of at least one molecule susceptible to oxidation in a reaction mixture or target environment, the method comprising the steps of:

a) providing an antioxidant precursor compound of the formula:

A—B

as described in ~~any one of~~ claim[[s]] 1 [[to 38]];

b) adding the compound to the reaction mixture or target environment; and

c) if necessary adjusting a temperature of the reaction mixture or target environment to a temperature sufficient to cause dissociation of the compound into free radicals A• and B•.

48. (original) The method of claim 47, wherein the step of adjusting comprises shifting the temperature of the antioxidant precursor compound from a lower temperature of from 0°C to 40°C to a higher temperature of from 20°C to 400°C.

49. (cancelled)

50. (cancelled)

51. (original) The method of claim 48, wherein the method involves a thermal cycle comprising a lower temperature portion following a higher temperature portion, the method further comprising step d) cooling the reaction mixture or target environment to the lower temperature portion of the thermal cycle thereby to cause at least partial reassociation of A and B to form the thermally activated antioxidant precursor compound A-B.

52. (cancelled)

53. (original) A composition comprising at least one molecule susceptible to oxidation, and two or more compounds according to claim 1, each of said two or more compounds having alternative combinations of moieties A and B.

54. (original) The composition of claim 53, wherein each of said two or more compounds comprises a labile bond having a bond strength that is different from all other compounds of said two or more compounds.

55. (cancelled)

56. (currently amended) A method for synthesizing the thermally activatable antioxidant precursor compound of claim 1, the method comprising the steps of:

a) providing a mixture comprising A-H, B-H and tert-butyl peroxide, wherein each H is a hydrogen atom[[;]] and each moiety A and B is the same or different; and

b) performing a photolysis reaction, preferably at about 350 nm, to produce t-BuOH and A-B.

57. (cancelled)

58. (cancelled)